Location, Location, Location ...

Geographic Information Systems are powerful tools for visualizing complex problems. But, despite widespread interest, the technology is stalled at State.

By Carol Christian

In the early morning of Oct. 8, 2005, thousands of Pakistanis were shaken out of their beds as a 7.6 magnitude earthquake struck Central Asia, centered just outside Muzaffarabad. Many thousands lost their lives, and government leaders implored other nations for rescue support and assistance. United States government agencies, including the Department of State, responded promptly. Answers to critical questions about the condition of infrastructure, location of affected populations, existence of assets and the distribution of State personnel with skills applicable to support the relief and assistance efforts were crucial for deployment of our resources. Coordination between organizations was important and progress on our efforts had to be monitored in the course of organizing personnel and supplies as critical issues continued to arise.

This scenario is reminiscent of many others, including the devastating Asian tsunami crisis of Dec. 26, 2004, and, more recently, the Indonesian earthquake of May 26, 2006. Foreign policy and diplomatic activities are intrinsically associated with information tied to a locality, region, country or larger area. In disasters, a quick, visual situation analysis such as an annotated map or "common operational picture" is critical for understanding where and how to best apply assets and coordinate with other organizations.

State personnel assess many other situations and issues that may affect U.S. national interests, including current conditions and trends in the economic, agricultural and political fields. Of course, security concerns, boundary negotiations and humanitarian issues, such as trafficking in persons and disaster response, and the ability to track commodities, are all critically important. Monitoring environmental data to ensure compliance with international treaties is another example. Within the department the management of grants, visa applications, personnel and physical assets — all tied to a location — is routine.

In all of these activities, a "smart map" is a potentially invaluable tool — a picture worth more than the proverbial thousand words. Geographic information system technologies capable of integrating, storing, editing, analyzing, displaying and regularly updating important textual information to a specific location or region are already in use in many federal agencies and international organizations. At the State Department, however, use of GIS systems remains limited — despite widespread interest and convincing testimony of the benefits.

The Power of GIS

We are reminded of the power of mapping and visualization systems every time we consult mapquest.com (*Mapquest*) or maps.google.com (*Google Maps*), Web sites that display streets and addresses selected by the user. These online tools also can display information from various databases such as "nearby hotels" or "shoe stores" on the same map by placing labeled icons on the map. The user can click on the icon and obtain more specific information such as the address, a telephone number and other relevant information, including hypertext links to other related material. Such simple GIS systems are in regular use through simple Internet browsers.

Some sites such as maps.google.com, earth.google.com and local.live.com also allow users to display satellite imagery for recognition of features and landmarks, espe-

Carol Christian served as a science fellow at the State Department from 2003 to 2006. She is an astrophysicist at Hubble's Space Telescope Science Institute. Her expertise is in information technology, visualization, education technology, instrumentation and studies of stellar populations. *She thanks the many individuals in several bureaus who assisted and collaborated on demonstrations and consulting on GIS within the department.*

Summer Fiction Contest

The *Foreign Service Journal* is seeking works of fiction (up to 3,000 words) for its annual contest. Story lines or characters involving the Foreign Service are preferred, but not required.

Going... going... gone...

All stories must be previously unpublished.

Include contact information and a short bio.

Limit one entry per author.

Send entries via e-mail as a Word attachment.

The top story, as selected by the *Journal's* Editorial Board, will be published in the July/August issue. Runners-up will be published in subsequent issues as space permits.

All winning stories will be posted on the *Journal's* Web site at www.fsjournal.org. The writer of each winning story will receive an honorarium of $250, payable upon publication.

Please send submissions (or questions) to the attention of Andrew Kidd, *FSJ* Business Manager at kidd@afsa.org.

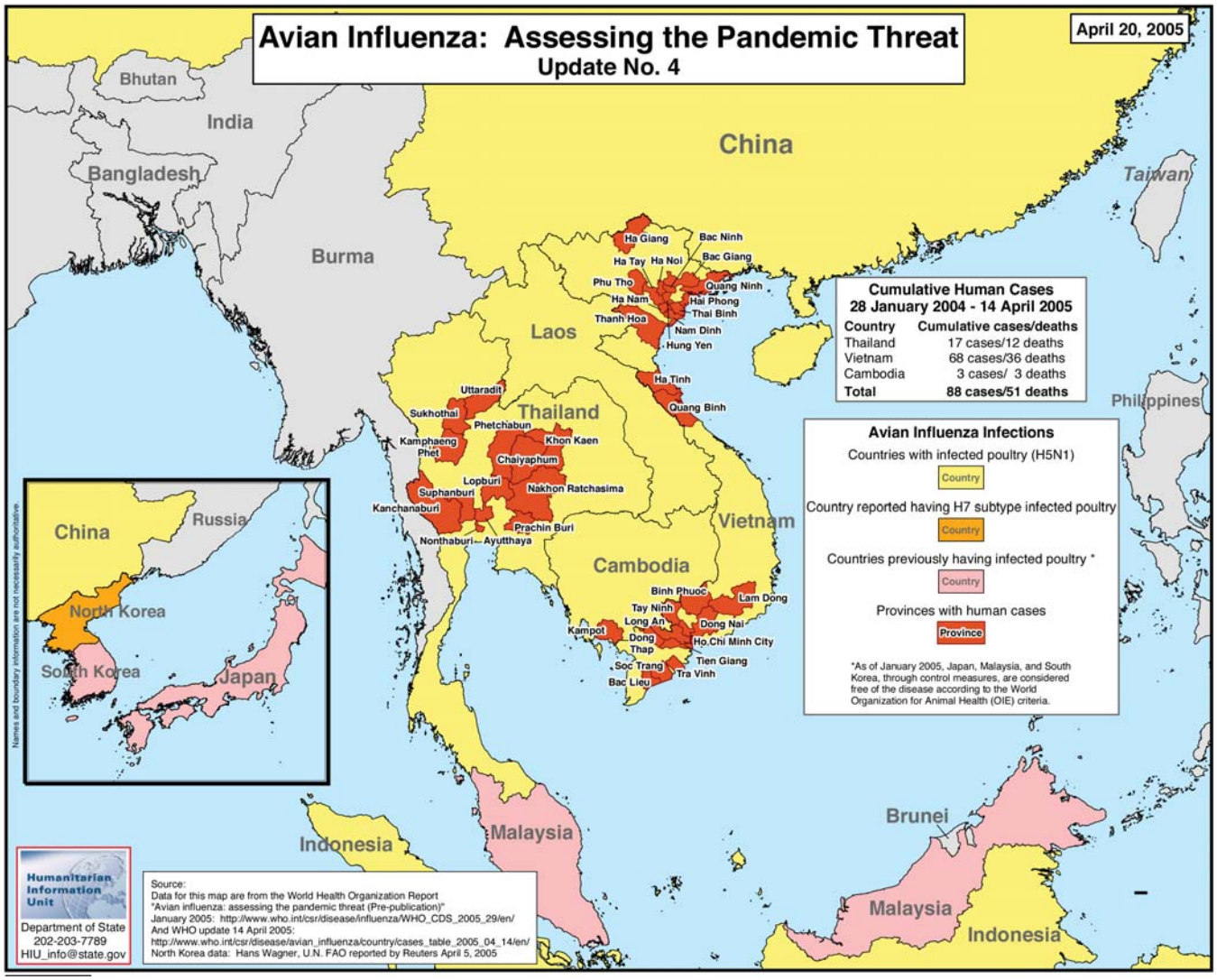
Deadline for submissions is March 1, 2007.

cially in urban areas. The latter two sites also include other capabilities for finding interesting locations and allowing the user to add their own "placemarks," or personalized markers linked to other information provided by the user.

Broadly, GIS technologies are used to analyze and display data, usually residing in a database or spreadsheet, in a graphical map form. The technology is useful for integrating large databases that can then be visualized showing patterns, trends and relationships that might otherwise go unnoticed or be unappreciated. Such systems can also facilitate data sharing among many diverse organizations. GIS and related technologies can be made available through online — and, if desired, interactive — tools that department personnel, including decision makers and problem-solvers, could be using to merge diverse yet up-to-date material affecting the policy issues addressed daily.

Many federal and international agencies use GIS effectively. The United Nations Office for Coordination of Humanitarian Affairs, for example, publishes maps and situation reports for disasters worldwide. Maps of the region affected by the Muzaffarabad earthquake, including an overview of the affected area and the flood risk were published on the OCHA Web site (www.ocha.org). The Defense Department uses GIS extensively, both domestically and in the field for operations. And the U.S. Department of Agriculture, the Federal Emergency Management Agency, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration all use GIS for a wide variety of situation analyses, strategic planning and long-term analysis, as well as day-to-day programmatic and operational activities.

Other organizations, such as the Red Cross, use GIS software products and then pick and choose data that can



Smart map Caption

be made publicly available through *GoogleEarth*. This latter strategy was particularly successful for documenting the location of Red Cross relief centers, operating schools and hospitals and other infrastructure after Hurricane Katrina. All of these agencies have data to share in GIS format, as do many commercial organizations.

GIS at State

Though currently limited to certain pockets, GIS technology is already used at the State Department. Some GIS software has been approved for OpenNet systems and a number of offices hold licenses for GIS tools.

The Bureau of Intelligence and Research's Geographic Information Unit has a long history of providing support in the form of maps — depicting crisis situations, border negotiations and the location of Americans abroad, among other topics. But in crisis situations information can become outdated quickly, and INR can be overloaded with high-priority requests. GIS technology not only increases efficiency in providing essential information, but can ensure its relevance through automatic updating.

INR's Humanitarian Information Unit routinely uses GIS to monitor the timelines of crises, and is currently examining new GIS tools from a variety of sources in cooperation with the Bureau of Information Resource Management's Business Center. GIU and HIU applications demonstrate clearly the utility in using the technology: the precise coordinates (obtained in the field with a Global Positioning System unit) of locations are essential to accurately deliver assistance, humanitarian aid and avoid unnecessary confusion (What school? Which hospital? What intersection?).

Several other offices already rely on GIS technology, as well. The Bureau of Administration uses it to record grants and contracts and allow posts to

report back to Washington. The Office of Strategic and Performance Planning within the Bureau of Resource Management actively uses GIS to augment performance planning activities as well as strategic planning, and produces numerous map products for a variety of bureaus.

In the field, Consulate Chengdu embraced the technology several years ago at the initiative of then-Consul General Jeff Moon, with expert support from the GIU and eDiplomacy Office. The results have been impressive. Officers are able to monitor economic trends, plan and document travel within the consular district, and report on various events within the region using GIS tools approved for use on OpenNet. A digital camera with a GPS unit records the precise position of digital images used to depict diplomatic visits and situations of policy interest. These pictures are then linked within the GIS so that, with a click of a mouse button, the image can be viewed along with ancillary documentation, all tied back to a specific location for visual clarity. The consulate has also succeeded in using satellite imagery imbedded in the GIS as a "base layer" to enhance understanding of the topographic features (and challenges) of the consular district.

Similar techniques are employed by Embassy La Paz, where, among other things, a recent science fellow at post created visual documentation on various safe routes in and out of the city for embassy personnel.

Recently, IRM's eDiplomacy office assisted a number of offices in exploring the utility of GIS technology in their work. The Bureau of Western Hemisphere Affairs' Office of Public Diplomacy and Public Affairs created a basic interactive online map derived from *Google Maps* to provide news feeds and current information pertaining to specific countries or regions. The Bureau of Economic and Business Affairs, working with the eDiplomacy office and the Bureau of Human Resources, has tested mechanisms to regularly produce GIS products that visually depict various economic indicators and trends around the world. For example, how does raising the price of oil a specific amount affect the gross domestic product of countries (e.g., in the Middle East) in terms of gains and losses? It is much easier to grasp the information in visual representations than shuffling multiple spreadsheets or textual documents; and once the basic template is constructed, the GIS system allows the user to look at historical data, trends and projections.

We are aware of the power of mapping and visualization systems every time we consult mapquest.com.

Survey Reveals Widespread Interest

A survey of individuals in the department, conducted in early 2006 by eDiplomacy in collaboration with other offices, revealed that interest in GIS is widespread. Survey results showed that there are numerous issues that could benefit from representation via this technology. Respondents described applications spanning the full range of the department's strategic interests: crisis monitoring, regular reporting on international economic and political developments, domestic concerns and routine internal administrative and logistical work. Staff from many bureaus and quite a few posts described a wide range of data that they collect, review, analyze and report on, noting that the sources of such data are largely external to the department.

Personnel are interested in obtaining additional varied data, in fields ranging from economics, narcotics, crime, trafficking, the environment, and consular affairs, to descriptions of U.S. physical assets and the distribution of our human resource expertise across the globe. All those surveyed expressed a keen interest in data that State could make available department wide, such as infrastructure location and integrity, populations, political boundaries and city data.

Many respondents lamented the fact that customary reporting is usually text-based, often giving incomplete or confusing information that could be better represented through visual tools. Not surprising, perhaps, the preferred method for reporting is e-mail with attachments or Power Point; cables rank lower on the preference list due to their text-only nature. Although there is neither widespread demand nor expectation — and no recommendation by management — employees do realize that trending, analysis and depiction of related but disparate data are best done visually.

A number of individuals noted that interactive Web-based materials would be quite useful, in addition to paper products and static digital renditions of maps such as those embedded in a presentation or made available on a Web site.

In light of the favorable response from the work force, what will it take to motivate the department as a whole to take advantage of the power of GIS? Many employees already realize the value of using such tools and have expressed as much in the survey responses, in e-mail feedback and the strong positive response to sporadic GIS users' meetings in the past. Can the department as a whole push its text-based culture to adopt such productive visual technologies? Or, as retired USIA FSO Wilson Dizard

posits in his 2001 book, *Digital Diplomacy: U.S. Foreign Policy in the Information Age*, will State maintain its "tendency to move slowly in adopting digital technologies to foreign policy operations"?

Moving Forward

Though a number of demonstrations and discussions have engaged a variety of individuals at State, no "tipping point" has been reached for adoption of the technology. Perhaps a prototype system that incorporates some key data from a few segments of the department might break through some of the current barriers. Cultivation of individual pockets of interest would be beneficial also. GIS users, for their part, recommend that a small office be established in IRM, RM or INR to deploy such a prototype and provide help to individual offices in finding appropriate entry-level software, arrange for initial training and consult on more complex GIS problems. This approach was successful when used to introduce other new resources such as Web sites, weblogs and OpenNet remote access.

Can the department as a whole push its text-based culture to adopt such productive visual technologies?

Further, users feel that modest investments in a dedicated, shared desktop system for their office would be beneficial and also suggest that a staff member be allowed to become the local GIS expert for simple applications. Employees in Washington and abroad expressed interest via the survey in receiving training to become aware of the capabilities of GIS. This was the approach taken in Chengdu: as a result, even if Foreign Service officers did not become local experts, they at least were aware of how GIS could support their work and readily interacted with someone who was expert in using the tools.

GIS has enjoyed strong growth ever since the 1990s: it is a technology that is here to stay. In transforming how we conduct diplomacy, the adoption of tools such as GIS can enhance our productivity and augment our situation awareness.

More information on the GIS survey and on other technologies beneficial to State Department work can be found at the eDiplomacy Web site and the Transformations community Web site on OpenNet. ■

Washington's Clear Choice in Corporate Accommodations

Today's business traveler does have a choice when it comes to short-term accommodations

CAS
Corporate Apartment Specialists, Inc.

- Rates within federal government per diem
- Completely furnished apartments
- Walking distance to Metro
- Washer/Dryer in unit
- Pet Friendly
- Cable TV/Local telephone service included
- V/MC/Amex/Diners Club accepted
- All utilities included
- Maid service available upon request

Location, Location, Location!
Choice neighborhoods of Washington, DC, Suburban Maryland, Northern Virginia

Toll-Free: 800 914-2802
Tel: 703 979-2830 Fax: 703 979-2813
E-mail: sales@corporateapartments.com
Web: www.corporateapartments.com

Flexcar
SHIFT YOUR THINKING.

Executive Lodging Alternatives

Interim Accommodations for Corporate and Government Markets

Apartments, Townhouses & Single Family Homes

"FOR THE EXECUTIVE ON THE MOVE"

finder5@IX.netcom.com
Locations throughout Northern Virginia and D.C.
Units fully furnished, equipped and accessorized
Many "Walk to Metro" locations
Pet Friendly

5105-L Backlick Road, Annandale, Virginia
Tel: (703) 354-4070 Fax: (703) 642-3619